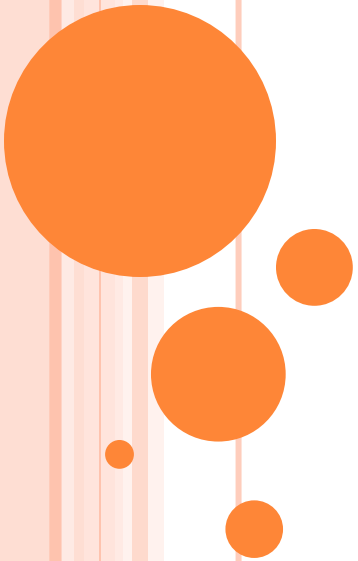


2.8 Patterns of Selection

Patterns of Selection

Mutations provide a continues supply of new genetic variations, which may be inherited and expressed as different phenotypes → observable traits caused from interaction between genes and the environment.

- Sickle-cell anemia, a serious blood disorder, is a useful example of how mutation, genetic variation, and the environment result in different patterns of natural selection.
- Many factors influence how selection can operate on individual phenotypes in a population. There are different sets of conditions that result in a number of general selection types.

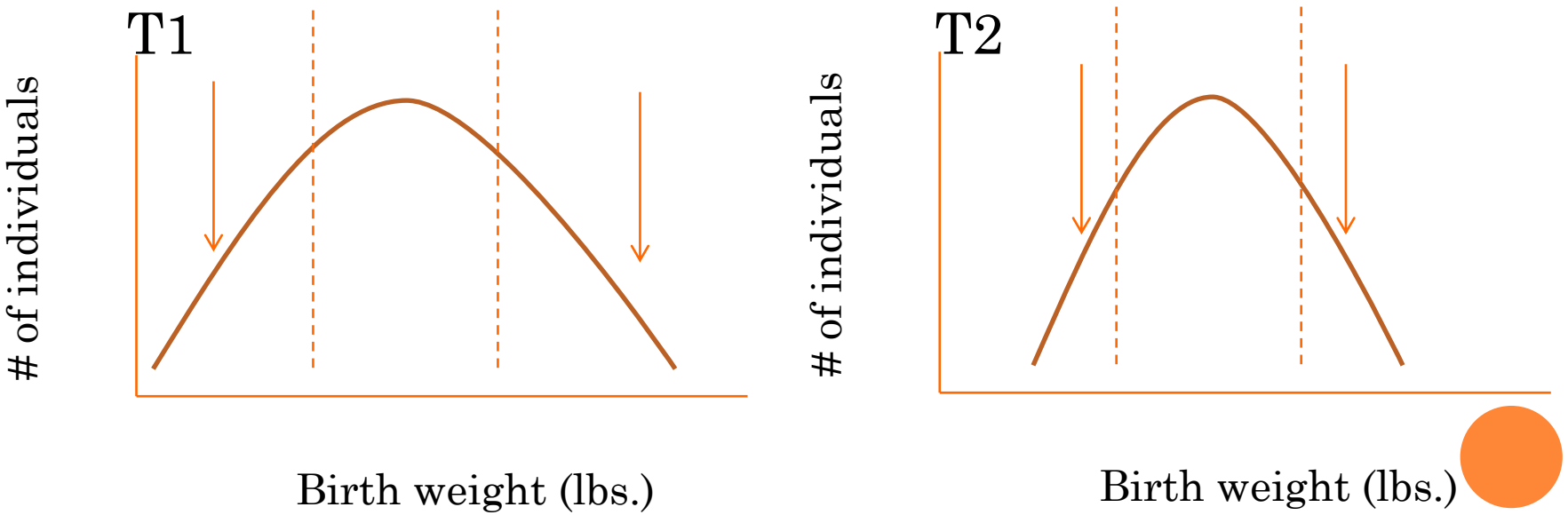
Types of Selection

There are 3 main patterns of selection:

- Stabilizing Selection
- Directional Selection
- Disruptive Selection
- Sexual Selection

Stabilizing Selection

- Is the most common form of selection
- It occurs when the most common phenotypes are favored by the environment.
- Example Human birthweight



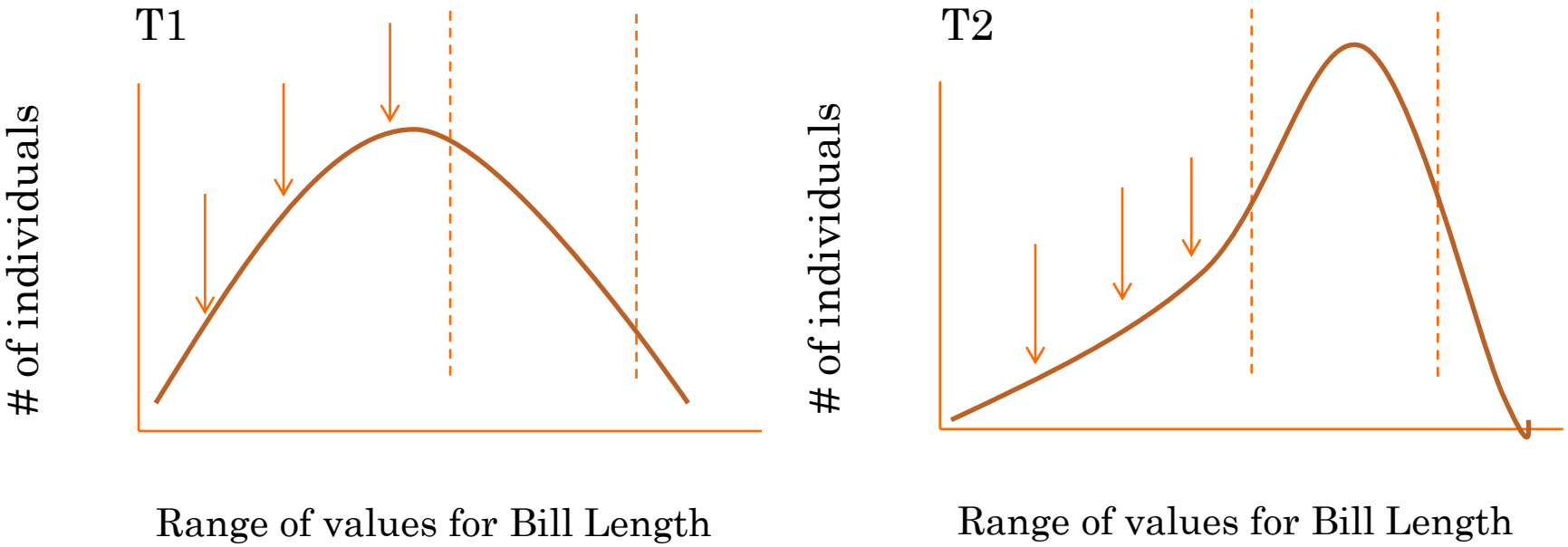
Arrows indicate the less successful forms

Directional Selection

Occurs when the environment favors individual with more extreme variations of a trait

- When an organism goes into a new environment, or when aspects of its habitat change it will encounter new forces of natural selection.
- May result in a observable change in the population
- In a new environment with long flowers, long-billed birds will have an advantage over birds with short and average sized bills

Directional Evolution



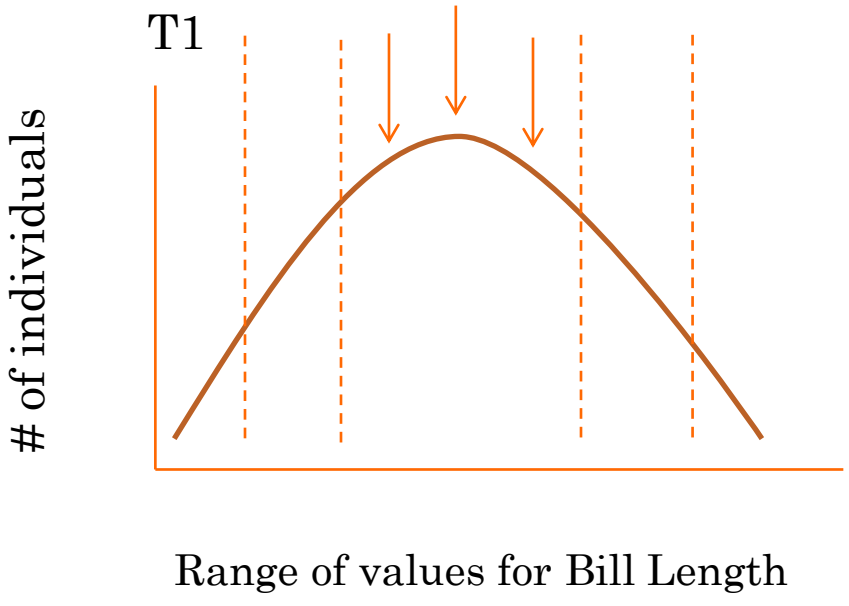
Arrows indicate the less successful forms

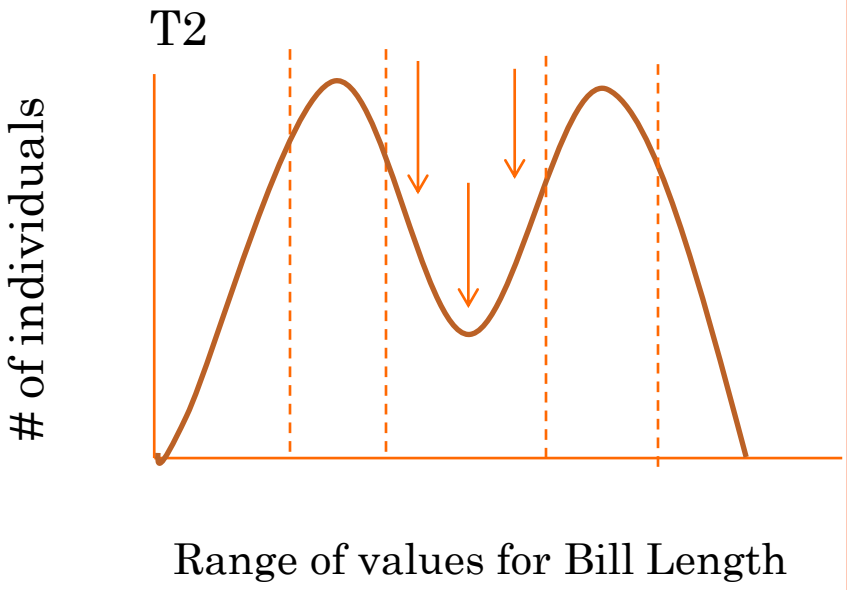
Disruptive Selection

Favors individuals with variations at opposite extremes of a trait over individuals with intermediate variations

- The environmental conditions many favor more than 1 phenotype
- It is a significant evolutionary mechanism for the formation of distinctive individuals within a population.
- There are 2 different flow sizes that do not suit the average-length bill of a hummingbird. So the birds with the longer and shorter bill will be more successful and will contribute more offspring to later generations.

Disruptive Selection





Arrows indicate the less successful forms

Sexual Selection

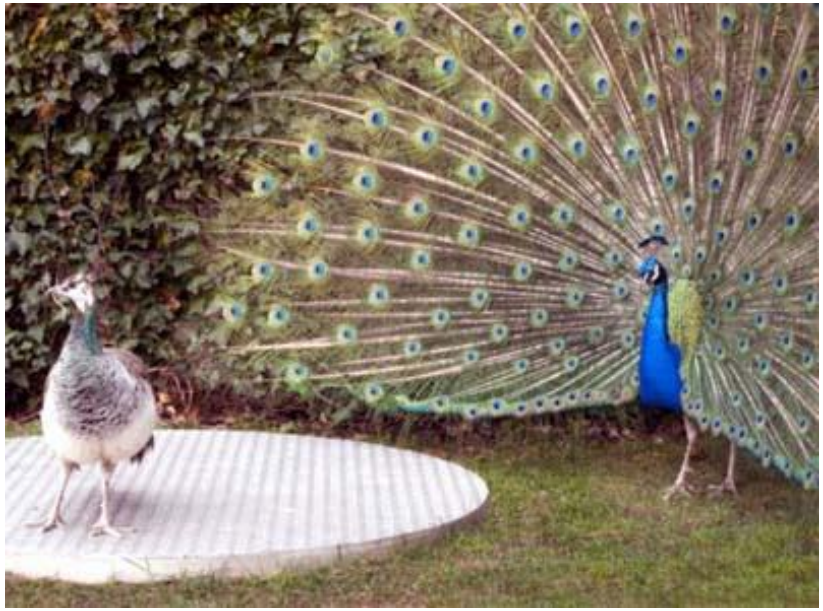
Favours the selection of any trait that influences the mating success of the individual

- The trait favoured in sexual selection includes **sexual dimorphism** → striking difference in the physical appearance of males and females and behavioural differences between the sexes.
- The most common forms of sexual selection result from female mate choice and from male vs. male competition.
- The fiddler carb's enlarged limb t flight off another male. Fiddler Crab video

Other Examples

Selection makes many organisms go to extreme lengths for sex: peacocks maintain elaborate tails, elephant seals fight over territories, fruit flies perform dances, and some species deliver persuasive gifts. Going to even more extreme lengths, the male redback spider literally flings itself into the jaws of death in order to mate successfully.

Peacock Video



Red-back Spider Video

Tungara Frog

……So, we can now say that organisms look and act the way they do since they have adapted to their environment (through natural selection) and to getting the best mates (through sexual selection)